

What is claimed is:

- 1 1. A method for pushing information to a client in an information processing system,  
2 the method comprising the steps of:  
3 gathering facts concerning user activity and forming the gathered facts into fact  
4 nets; and  
5 identifying and pushing reportable facts to a system client.
- 1 2. The method as set forth in Claim 1, including the steps of deriving new facts from  
2 the facts within the fact nets, and incorporating the new facts into the fact nets.
- 1 3. The method as set forth in Claim 1, including the step of repeating all steps until  
2 stopped.
- 1 4. The method as set forth in Claim 3, wherein the repeating step includes executing  
2 the previous steps concurrently as independent threads.
- 1 5. The method as set forth in Claim 4, including the steps of defining a no-longer-  
2 valid fact, and pruning no-longer-valid facts from the fact nets.
- 1 6. The method as set forth in Claim 3, including a step of triggering the deriving and  
2 the pushing steps upon the formation of the fact nets.
- 1 7. The method as set forth in Claim 6, wherein the triggering occurs upon the  
2 derivation of new facts, thereby defining an iterative process of re-evaluation and  
3 reporting.
- 1 8. The method as set forth in Claim 7, including a step of deriving every possible fact  
2 that can be derived each time a new fact is added.

1 9. The method as set forth in Claim 1, further including the step of defining an  
2 extended environment with which the user does not interact, and wherein the gathering  
3 step includes the steps of defining facts corresponding to events in user activity and in the  
4 extended environment, monitoring the events, and creating corresponding facts.

1 10. The method as set forth in Claim 1, wherein the step of forming fact nets includes  
2 defining a fact data structure, defining a linkage between fact data structures, defining a  
3 fact net as a data structure incorporating at least one fact data structure, and multiple  
4 instances of fact data structures being linked.

1 11. The method as set forth in Claim 1, wherein the deriving step includes one of:  
2 translating one fact into a new fact; inferring a new fact from one or more facts; using one  
3 or more facts to form an address, then using the address to lookup a new fact in an  
4 information resource; and also includes creating an instance of the fact data structure to  
5 contain the new fact.

1 12. The method as set forth in Claim 11, wherein the step of incorporating a new fact  
2 into a fact net includes: defining a parent linkage and a child linkage for each new fact;  
3 setting the parent linkage in the new fact with a pointer to each parent fact used to derive  
4 the new fact; and setting the child linkage in each parent fact with a pointer to the new  
5 fact.

1 13. The method as set forth in Claim 1, wherein the identifying step includes defining a  
2 fact type for each fact, and creating an agent for reporting facts to a client and responsive  
3 to facts of at least one defined type.

1 14. The method as set forth in Claim 13, wherein the reporting agent pushes a fact by  
2 obtaining a copy of the fact from a fact net and delivering the copy to the system client.

1 15. The method as set forth in Claim 12, further including the steps of defining a  
2 lifetime for a fact, defining a no-longer-valid fact as having an expired lifetime, defining a  
3 descendant of a fact, pruning a no-longer-valid fact and all its descendants when the fact  
4 lifetime expires, and resetting the child linkage for each non-pruned parent fact of the  
5 pruned fact and its descendants.

1 16. The method as set forth in Claim 15, including the step of recreating a pruned fact  
2 and incorporating the recreated fact into a fact net, the included step defining an  
3 independent, concurrent thread.

1 17. The method as set forth in Claim 1, wherein the client is an application program  
2 that displays facts for user viewing.

1 18. The method as set forth in Claim 1, wherein the client is an application program  
2 that archives facts for later use.

1 19. The method as set forth in Claim 1, including the steps of defining a dynamic user  
2 model as a collection of all the fact nets, defining a system operating session, saving the  
3 model at the end of an operating session, defining a next operating session, and restoring  
4 the dynamic user model at the start of a next session, thereby permitting the model to  
5 define user activity and resulting inferences across operating sessions.

1 20. The method as set forth in Claim 19, including the steps of defining a user  
2 preference check list, creating new facts corresponding to each user-checked preference  
3 on the list, and extending the dynamic user model by placing the new facts into the  
4 dynamic user model.

1 21. A system for monitoring events in an environment, for making inferences about the  
2 monitored events, and for reporting selected inferences to a client, the system comprising:

3 at least one observer agent for monitoring a selected event of an environment, and  
4 for creating a primitive fact which incorporates a status of the monitored event; and  
5 at least one reporter agent for examining all existing facts, for identifying a  
6 reportable fact, and for delivering a copy of the reportable fact to a receiving client.

1 22. The system as set forth in Claim 21, wherein the at least one observer agent, and  
2 the at least one reporter agent each defines an independent, concurrent programming  
3 thread.

1 23. The system as set forth in Claim 22, wherein the at least one reporter thread is  
2 triggered by the creation of each new primitive fact, whereby delivery of reportable facts  
3 to a client is triggered by occurrence of monitored events.

1 24. The system as set forth in Claim 21, including at least one fact deriving agent for  
2 examining all existing facts, for creating new facts from one or more existing facts, and for  
3 linking each new fact to a parent fact of the new fact, forming fact nets of linked facts.

1 25. The system as set forth in Claim 24, including a fact pruning agent defining a no-  
2 longer-valid fact and a descendant of a fact, the fact pruning agent eliminating each no-  
3 longer-valid fact and all its descendants from the fact nets.

1 26. A method for creating and using a dynamic model to push information to a client  
2 in an information processing system, the method comprising the steps of:  
3 building and maintaining a dynamic model; and  
4 using the dynamic model for pushing information to a receiving client.

1 27. The method as set forth in Claim 26, further including the step of triggering the  
2 information pushing on changes in the dynamic model.

1 28. The method as set forth in Claim 26, wherein the dynamic model includes  
2 information defined by a current web page being viewed by a user of the information  
3 processing system, and wherein the web page information in the dynamic model is used to  
4 access and push news stories related to the web page, and to access and push stock prices  
5 related to the web page.

1 29. The method as set forth in Claim 26, wherein the dynamic model includes  
2 information defined by keystrokes made by a user of the information processing system,  
3 and wherein the keystroke information further defines correct and incorrect user  
4 keystrokes, and the keystroke information is used to construct typing exercises aimed at  
5 improving user typing skill, and wherein the exercises are pushed to the user.

1 30. The method as set forth in Claim 26, wherein the dynamic model includes  
2 information derived from user interactions with an application program of the information  
3 processing system, and the application program interaction information is used to access  
4 additional information about the application program via a network, such as one of  
5 program updates and related and competing programs.

1 31. A system for pushing information to a client in an information processing system,  
2 the system comprising:  
3 means for gathering facts concerning user activity and for forming the gathered  
4 facts into fact nets; and  
5 means for identifying and for pushing reportable facts to a system client.

1 32. The system as set forth in Claim 31, including means for deriving new facts from  
2 the facts within the fact nets, and for incorporating the new facts into the fact nets.

1 33. The system as set forth in Claim 31, including means for continuing until stopped.

1 34. The system as set forth in Claim 33, wherein said continuing means further  
2 includes each of said previous means defining concurrent, independent program threads.

1 35. The system as set forth in Claim 34, further including means for defining a no-  
2 longer-valid fact, and for pruning no-longer-valid facts from the fact nets.

1 36. The system as set forth in Claim 32, including means for triggering the deriving  
2 and the pushing means upon the formation of the fact nets.

1 37. The system as set forth in Claim 36, wherein the triggering occurs upon the  
2 derivation of new facts, thereby defining an iterative means of re-evaluation and reporting.

1 38. The system as set forth in Claim 37, including means for deriving every possible  
2 fact that can be derived each time a new fact is added.

1 39. The system as set forth in Claim 31, further including means for defining an  
2 extended environment with which the user does not interact, and wherein the gathering  
3 means includes means for defining facts corresponding to events in user activity and in the  
4 extended environment, for monitoring the events, and for creating corresponding facts.

1 40. The system as set forth in Claim 31, wherein said means for forming fact nets  
2 includes means for defining a fact data structure, for defining a linkage between fact data  
3 structures, for defining a fact net as a data structure incorporating at least one fact data  
4 structure, and means for linking multiple instances of fact data structures.

1 41. The system as set forth in Claim 31, wherein said deriving means includes means  
2 for one of: translating one fact into a new fact; inferring a new fact from one or more  
3 facts; using one or more facts to form an address, then using the address to lookup a new  
4 fact in an information resource; and also includes means for creating an instance of the fact  
5 data structure to contain the new fact.

1 42. The system as set forth in Claim 41, wherein said means for incorporating a new  
2 fact into a fact net includes: means for defining a parent linkage and a child linkage for  
3 each new fact; means for setting the parent linkage in the new fact with a pointer to each  
4 parent fact used to derive the new fact; and setting the child linkage in each parent fact  
5 with a pointer to the new fact.

1 43. The system as set forth in Claim 31, wherein said identifying means includes means  
2 for defining a fact type for each fact, and for creating an agent for reporting facts to a  
3 client and responsive to facts of at least one defined type.

1 44. The system as set forth in Claim 43, wherein the reporting agent includes means  
2 for pushing a fact by obtaining a copy of the fact from a fact net and delivering the copy to  
3 the system client.

1 45. The system as set forth in Claim 42, further including means for defining a lifetime  
2 for a fact, for defining a no-longer-valid fact as having an expired lifetime, for defining a  
3 descendant of a fact, for pruning a no-longer-valid fact and all its descendants when the  
4 fact lifetime expires, and for resetting the child linkage for each non-pruned parent fact of  
5 the pruned fact and its descendants.

1 46. The system as set forth in Claim 45, including means for recreating a pruned fact  
2 and for incorporating the recreated fact into a fact net, the included step defining an  
3 independent, concurrent thread.

1 47. The system as set forth in Claim 31, wherein the client is an application program  
2 that displays facts for user viewing.

1 48. The system as set forth in Claim 31, wherein the client is an application program  
2 that archives facts for later use.

1 49. The system as set forth in Claim 31, including means for defining a dynamic user  
2 model as a collection of all the fact nets, for defining a system operating session, for  
3 saving the model at the end of an operating session, for defining a next operating session,  
4 and for restoring the dynamic user model at the start of a next session, thereby permitting  
5 the model to define user activity and resulting inferences across operating sessions.

1 50. The system as set forth in Claim 49, including means for defining a user preference  
2 check list, for creating new facts corresponding to each user-checked preference on the  
3 list, and for extending the dynamic user model by placing the new facts into the dynamic  
4 user model.